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## CLAIMS

1. Tyre for vehicle wheels, comprising a torus-shaped carcass which has a central crown portion and two axially opposite sidewalls terminating in a pair of beads for fixing the tyre onto a corresponding mounting rim, each bead comprising at least one circumferentially unextendable annular reinforcing core, a tread strip which is located on the crown and coaxially extends around said carcass and is provided with a raised pattern for rolling contact with the road, and a belt structure coaxially arranged between said carcass and said tread strip, said carcass being provided with a reinforcing structure essentially consisting of at least one ply of rubberized fabric which is reinforced with metal cords lying in radial planes containing the axis of rotation of the tyre, said reinforcing structure having its ends secured to said annular reinforcing cores, and a neutral profile, lying in a radial cross-sectional plane, axially extending from bead to bead, characterized in that said neutral profile intersects the cross section of the zone which encloses said annular reinforcing cores and in that the ends of said reinforcing structure extend radially inwards not beyond the radially innermost profile of said annular reinforcing cores.
2. Tyre according to Claim 1, characterized in that said neutral profile along its extension between said beads has a continuous curvature devoid of inflection points.
3. Tyre according to Claim 1, characterized in that said annular reinforcing core comprises a first axially innermost bead core and a second axially outermost bead core, one end of said carcass ply being inserted between said first and second bead cores.
4. Tyre according to Claim 1, characterized in that said carcass ply

comprises a plurality of rubberized-fabric bands which are alternately arranged, in at least one of said beads, on axially opposite sides of said annular reinforcing core.

5 5. Tyre according to Claim 4, characterized in that said carcass ply comprises two series of bands which are radially superimposed at least on the crown of said tyre.

10 6. Tyre according to Claim 1, characterized in that said annular reinforcing core, in the plane of its cross section, is formed with an irregular trapezoidal shape which comprises two bases, i.e. a radially internal base 9a and a radially external base 9b, and two inclined sides, i.e. an axially internal side 9c and an axially external side 9d.

15 7. Tyre according to Claim 6, characterized in that the angle of inclination, with respect to the axis of rotation of the tyre, of the axially external and axially internal sides of said trapezium is respectively greater than and smaller than the angle of inclination of said neutral profile of the carcass plies in the region of said sides.

20 8. Tyre according to Claim 6, characterized in that the longitudinal dimension (z) of the inclined sides of the bead core (9) is between 10 and 25 mm and the transverse dimension (v) of the bases of said bead core is between 7 and 20 mm.

25 9. Tyre according to Claim 1, characterized in that said annular reinforcing core comprises a series of spirals of metal wire which are radially superimposed and axially arranged alongside each other.

10. Tyre according to Claim 9, characterized in that the material of said spirals of metal wire is steel with a high carbon content.

11. Tyre according to Claim 9, characterized in that the cross section of

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said metal wire is hexagonal.

12. Tyre according to Claim 1, characterized in that said annular reinforcing core comprises a series of radially superimposed spirals of flat metal strip.

5 13. Tyre according to Claim 1, characterized in that said annular reinforcing cores are not subject to a twisting torque owing to the inflation pressure of the tyre.

10 14. Method for increasing the load capacity of a tyre for vehicle wheels, comprising a torus-shaped carcass which has a central crown portion and two axially opposite sidewalls terminating in a pair of beads for fixing the tyre onto a corresponding mounting rim, each bead comprising at least one circumferentially unextendable annular reinforcing core, said carcass being provided with a reinforcing structure essentially consisting of at least one ply of  
15 rubberized fabric which is reinforced with metal cords lying in radial planes containing the axis of rotation of the tyre, said reinforcing structure having its ends secured to said annular reinforcing cores, and a neutral profile, lying in a radial cross-sectional plane, axially extending from bead to bead, said method comprising the steps of:  
20 - limiting the radial extension inwards of the ends of said reinforcing structure so that they do not extend beyond the radially innermost profile of said annular reinforcing cores;  
- causing said neutral profile to intersect the cross section of the zone which encloses said annular reinforcing cores.

25 15. Method for eliminating the twisting torque, in the plane of the radial cross section, which is applied to the annular bead-reinforcing cores in a tyre for vehicle wheels comprising a torus-shaped carcass which is provided with a reinforcing structure essentially

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consisting of at least one ply of rubberized fabric which is reinforced with metal cords lying in radial planes containing the axis of rotation of the tyre, said reinforcing structure having its ends secured to said annular reinforcing cores, and a neutral profile, lying in a radial cross-sectional plane, axially extending from bead to bead, said method comprising the steps of:

- eliminating the inflection points along the extension of said neutral profile of the reinforcing structure;
- causing said neutral profile to intersect the cross section of the zone which encloses said annular reinforcing cores.

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